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for

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Limits

Preview/Index

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Details

Display

Abstract

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☐ 1: Appl Biochem Biotechnol. 1998 Spring;70-72:341-52.

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Cloning and sequence analysis of the poly (3-hydroxyalkanoic acid)-synthesis genes of *Pseudomonas acidophila*.

Umeda F, Kitano Y, Murakami Y, Yagi K, Miura Y, Mizoguchi T.

Faculty of Pharmaceutical Sciences, Osaka University, Japan.

Pseudomonas acidophila can grow with CO₂ as a sole carbon source by the possession of a recombinant plasmid that clones genes that confer chemolithoautotrophic growth ability derived from the H₂-oxidizing bacterium *Alcaligenes hydrogenophilus*. H₂-oxidizing bacteria produce poly(3-hydroxybutyric acid) (PHB) from CO₂, but recombinant *P. acidophila* can produce the more useful biopolymer poly(3-hydroxyalkanoic acid) (PHA). In this study, the *pha* genes of *P. acidophila* were cloned and a sequence analysis was carried out. A gene library was constructed using the cosmid vector pVK102. A recombinant cosmid carrying the *pha* genes was selected by the complementation of a PHB-negative mutant of *Alcaligenes eutrophus* H16. The resulting recombinant cosmid pIK7 contained a 14.8-kb DNA insert. Subcloning was done, and the recombinant plasmid pEH74 was selected by hybridization with the *A. eutrophus* H16 *pha* genes. *Escherichia coli* possessing pEH74 produced PHB, indicating that pEH74 contained the *pha* genes of *P. acidophila*. The nucleotide sequences of the PHA-synthesis genes *phaA* (beta-ketothiolase), *phaB* (acetoacetyl-CoA reductase), and *phaC* (PHA synthase) in pEH74 were determined. The homologies of *phaA*, *phaB*, and *phaC* between *P. acidophila* and *A. eutrophus* H16 were 64.7, 76.1 and 56.6%, respectively.

PMID: 9627389 [PubMed - indexed for MEDLINE]

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